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Summary

The Seismic Safety Committee of the Washington State Emergency Management Council (EMC) met on June 21, 2001 to review the response to the February 28, 2001 Nisqually Earthquake and to plan an update to statewide policy on earthquake safety.

The Seismic Safety Committee (SSC) is comprised of representatives from state and local government, port districts, academia, professional organizations and businesses. All members have responsibility or expertise in hazard mitigation planning. The primary work of the SSC is threefold: 1) to provide policy recommendations on seismic safety to the Emergency Management Council (EMC), 2) to advocate for seismic safety issues across the state, and 3) to provide the EMC an annual assessment of statewide implementation of seismic safety improvements.

The Seismic Safety Advisory Committee (SSAC) produced a statewide baseline earthquake safety study in 1991. That document, the *Policy Plan for Improving Earthquake Safety in Washington*, needs updating to reflect new scientific understanding of earthquake hazards in Washington.

An important part of this meeting was to develop a new charter and define three formal subcommittees charged with doing the work that lies ahead in updating, developing, and ranking strategies for seismic safety improvements.

Meeting Conclusions

- **Restarted the Seismic Safety Committee process.** The process needs a strong committee. They need to set priorities for the state and find the retrofit funding available after the Nisqually Earthquake. The SSC revised their charter, the first step in restarting the committee process. The following were accomplished during this meeting:
 - Revised charter.
 - Established three subcommittees: 1) Information and Technology, 2) Preparedness, and 3) Mitigation.
- **Discussed approach to Revising Earthquake Safety Policy Plan.** The group agreed that in 10 years much has been done to reduce the risks from earthquake hazards but new science and technology and the experience of a 6.8 quake in the Olympia region confirm that the baseline study needs revision.
- **Reviewed Procedure for Hazard Mitigation Grants.**

Meeting Agenda

The purpose of the meeting was to bring together committee members to review and act on four major topics:

- Seismic Safety Committee
- Nisqually Earthquake impact and response
- Hazard Mitigation Grant Program
- Review and approval of a Draft Seismic Safety Committee charter and establishment of subcommittees

Seismic Safety Committee

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The Seismic Safety Committee (SSC) is a committee of the Emergency Management Council (EMC), a 17-member body mandated to advise the governor on state and local emergency management seismic issues. The SSC was formally established as part of the EMC on June 13, 1996. By statute, the SSC is charged with improving earthquake safety statewide. It provides three major services to state government: 1) policy recommendations, 2) advocacy for seismic safety issues, and 3) an annual report on the status of seismic safety improvements.

In its five-year history, SSC has made recommendations that include the following: 1) improve emergency planning and 2) strengthen buildings and lifelines. The group's June 1998 assessment identified three areas that need additional improvement:

1. Strengthen buildings
2. Strengthen lifelines
3. Transportation infrastructure.

The Emergency Management Council has tasked the committee to complete the following:

- Review the following three baseline reports:
 - *A Policy Plan for Improving Earthquake Safety in Washington 1991*
 - *Earthquake Safety in Washington State 1998*
 - *Hazard Mitigation Survey Team Report: Nisqually Earthquake, February 28, 2001*
- Make new recommendations to EMC for seismic safety
- Rank and coordinate seismic safety priorities for the Washington State Strategic Plan
- Advise or serve as a member of the Hazard Mitigation Strategy Team and HMGP Grant Review Team

Group Comments:

- Where would newer members get copies of background materials? Contact George Crawford.

Nisqually Earthquake Review

Nisqually Earthquake Science Overview

Tim Walsh

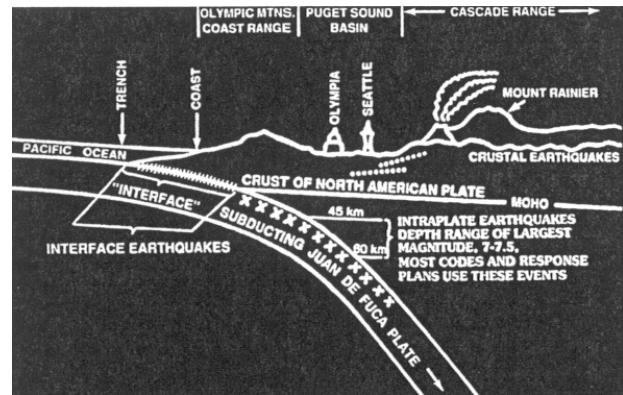
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A major lesson learned from the 6.8 Nisqually Earthquake is that there were few surprises. The Nisqually quake repeated damage and ground failure patterns seen from large magnitude Benioff zone earthquakes in Puget Sound in the 20th century.



Cascadia earthquakes have three sources: 1) the subduction zone, 2) deep within the Juan de Fuca plate (Benioff zone) or 3) crustal faults. The Nisqually Earthquake (>50 km below the surface) was less damaging than one generated from either of the other two potential sources. Core planning for earthquakes before 1991 was dominated by preparation for deep Benioff zone quakes like the Nisqually.

Nearly all of the effects from the Nisqually Earthquake could be predicted based on this well-documented history. In 1991, earth scientists and engineers were beginning to grapple with the effects of a large Cascadia subduction zone earthquake. No known evidence at the time supported activity on the Seattle Fault, which is now recognized as one of the country's most dangerous urban faults.

Several comparisons have emerged from data following the quake. Based on a comparison with the 1949 Olympia quake, it appears that the Nisqually event was slightly smaller. The Nisqually Earthquake is also notable because it's the first big, urban earthquake recorded by the Advanced National Seismic System. Data from the system recorded at the University of Washington was used to generate a SHAKEMAP to show strength of ground motion across Puget Sound. In comparing SHAKEMAPs from the Nisqually and Northridge earthquakes, it is apparent that ground motion was considerably less from the Nisqually Earthquake due in large part to its depth.

Group Comments:

- County Commissioners had seen this presentation and were very interested in it.
- It has not been presented to the Legislature
- Suggested that US Congresspersons be given this presentation

Nisqually Earthquake Response

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The message from the response side of the Nisqually Earthquake mirrors that of the science: There were no surprises. Ten years of work paid off notably in school safety and the ability of local governments to respond

to this disaster. Factors that minimized damages from this quake include its depth, the Disaster Resistant Communities Program, and extensive preparedness programs in school safety, the "Drop, cover and hold" program, and state and local response measures.

A simple chronology of the event response confirms that disaster management policies worked well:

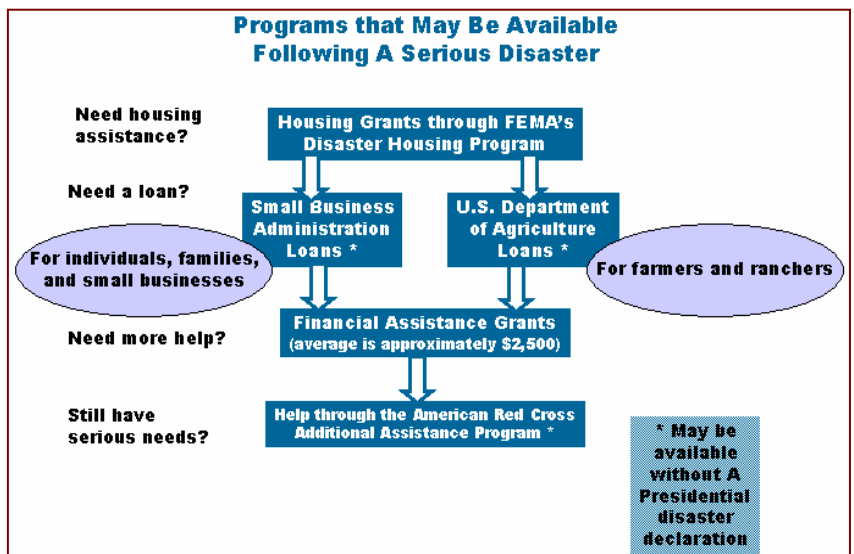
Nisqually Earthquake Response	
28 February 2001	<ul style="list-style-type: none"> • 10:54 am -- 6.8 earthquake • 11:00 am -- WA EOC activated • 1:00 pm -- Governor signs Proclamation of Emergency
1 March 2001	<ul style="list-style-type: none"> • 6:15 -- FEMA ERT-A arrives Camp Murray • 1:00 pm -- Governor requests Presidential Declaration • 5:00 pm -- Presidential Disaster Declaration approved
5 March 2001	<ul style="list-style-type: none"> • 8:00 am -- Disaster field office established in Olympia

FEMA set a record in responding to the quake. Within a week of the event, \$1.9M in checks was in the mail and 500 staff in place. The Camp Murray disaster center's seismic design likewise worked well. The center lost neither power nor automation capabilities.

Who was affected? Some 407 people were reported injured in the quake. Of those, only one death was recorded and was attributed to a heart attack.

What was affected? Infrastructure, transportation and communications were not severely affected:

- **Infrastructure:**
 - **Utilities.** Immediately following the quake, 200,000 households lost power, which was soon resumed.
 - **State Agencies.** The Legislature and certain state offices were hardest hit. Non-structural damages from lost productivity could have been avoided.
 - **Business.** CREW is doing an assessment of this.
 - **Schools.** Held up well. Retrofits were effective.
 - **Homes.** Field claims with FEMA show that 350,000 homes were affected.
- **Transportation:** Coleman Dock and King County Airport were damaged. Sea-Tac Airport landed only 75% of normal traffic due to loss of its landing tower. Initially, 9 roads and 14 bridges were closed. Three roads and four bridges remain closed and are likely to be closed up to a year with total repairs in excess of \$200M.
- **Communications:** Cellular systems were overloaded. Incoming calls were restricted. E-mail servers were overloaded and shut down. But back-up communications worked (amateur radio, NAWAS, 900 MHz radio)



The Recovery. Under the Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) several recovery programs are available. FEMA administers the programs. The FHWA and American Red Cross also have programs. The Red Cross established five shelters (Olympia, Chehalis, Seattle, Aberdeen and Auburn) within 6 hours of the event. These shelters provided 131 overnight stays and an additional 22 sites provided 6,521 meals through March 3, 2001. Disaster programs to date have provided \$70M in assistance to human services and \$240M to public agencies.

Several Disaster Field Office (DFO) programs are available after a serious disaster. DFOs process individual and public claims of damage and loss from major disasters. State and federal governments jointly establish a DFO to process loans and grants. State and federal coordinating officers jointly run the DFO. Funding is 75% federal and 25% state when a Presidential Disaster is declared. This group will transition down after December of this year, but will continue to operate for four to five years.

Two new tools improved the response to the quake. HAZUS, the earthquake impact estimation model, was able to run a model within a few hours of the event. And the EMD website allowed a small staff to reach many people with accurate data, including step-by-step instructions to take to get assistance for those impacted by the quake.

Nisqually Earthquake Clearing House

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The Nisqually Earthquake Clearing House, instituted by FEMA, is a new way to capture and share data. The clearinghouse concept was first used following the Northridge Earthquake. Its purpose is to find the most efficient way to use data and sort vital issues upon which to initially focus technical expertise. A clearinghouse operates in three stages.

The Clearing House served several functions following the Nisqually quake. Among the benefits: linking DFO programs and researchers, brainstorming across disciplines, hosting visiting scientists and emergency managers, and validating HAZUS loss estimation.

Stage	Sponsor	Function (user)	Lifetime	Product
1.	EERI & UW Dept Civil Eng	Recon & Data Collection (researchers)	3 days	EERI Report
2.	FEMA, EMD, USGS, DNR, UW Depts	Data Hub & Conduit (researchers & disaster prgms)	6 months	Issues ID, Applications, HAZUS validation
3.	UW WAGDA?	Data archive & access (anyone)	Long-term	Web accessible comprehensive database

Lessons learned from running a clearinghouse in Washington are the need to streamline the process (particularly staffing and contracting). More response and recovery applications are possible if set-up time can be accelerated.

Hazard Mitigation Grant Program

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Long-term cost-effective actions can significantly reduce or eliminate the risks from future disaster events and break the costly damage repair cycle. "Hazard Mitigation" is defined as any action taken to reduce the loss of life or damage to property from natural hazards. By law, the President can grant up to 80% of the cost of hazard mitigation measures deemed cost effective and likely to reduce damage and suffering.

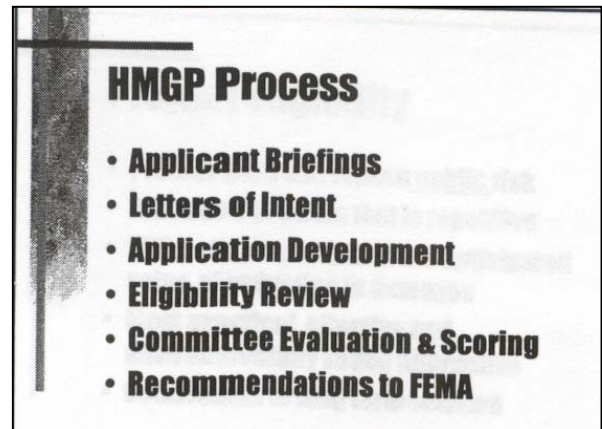
The Hazard Mitigation Grant Program (HMGP) is accepting applications from communities that have plans. The HMGP process can provide mitigation anywhere in a declared disaster county. The costs are shared 75% federal, 12.5 state and 12.5 local.

The grant applicant selection process is highly competitive and usually requires 10 times the available funds. For a project to be eligible, it must:

- Protect lives and reduce public risk
- Address a problem that is repetitive
- Cost no more than the anticipated value of reduced damages
- Be the most practical, effective and environmentally sound alternative
- Provide a long-term solution

The program restricts projects from duplicating other federal programs and it must meet NEPA criteria for public involvement and not funding projects that have already begun or been completed. The State's role in the HMGP is to determine a ranking system for funding, developing a Hazard Reduction Plan and technical assistance to grant applicants.

The HMGP is currently trying to provide a transition phase, but the grant program can't move until it gets something from FEMA .



SSC Charter

George Crawford

The group discussed revisions to its charter. The draft charter is presented on the following two pages. Among the points discussed in the suggested revisions were the following:

- Assure that the state as a whole benefits from the SSC process
- Lifeline issues need careful treatment: ownership and other issues
- Membership in the subcommittees needs careful assessment. Business needs broader inclusion
- The purpose of the report needs to be overall seismic safety

- The report needs to present a consistent methodology for reporting to the Legislature

The group selected three subcommittees taken from the 1991 plan:

- Information and technology
- Preparedness
- Mitigation

The draft charter is on the following two pages.

Charter

Emergency Management Council

Seismic Safety Committee

Purpose:

Prepare and submit to the Emergency Management Council (EMC) statewide strategies, policies, and recommendations that address the seismic threat through mitigation, preparedness, response and recovery activities. This will be established through a collaborative effort and consensus of committee members representing stakeholder organizations across the state.

Objectives:

To serve as the EMC's focus group for all activities related to seismic safety:

1. Identify and promote existing state, local and regional mitigation initiatives that model implementation of committee advocated strategies;
2. Coordinate the development of a statewide strategy for educating, mitigating, planning and responding to the threat of seismic events. Review the Seismic Safety Committee's A Policy Plan for Improving Earthquake Safety in Washington – Fulfilling Our Responsibility, December 1, 1991 as a baseline reference;
3. Promote an effective and coordinated mechanism to assess and disseminate risk and threat information;
4. Identify resource opportunities to include but not limited to funding, equipment, staffing, and technology. Recommend appropriate lead agencies or entities for specific seismic issues;
5. Provide a forum for general coordination and the exchange of information among federal, state, local, and private entities;
6. Recommend legislation and policy changes to improve and enhance statewide seismic safety;
7. Develop a method for an annual assessment report of statewide implementation of seismic safety improvements, deficiencies and needs to the EMC using a consistent format and method;
8. Evaluate and prioritize recommendations on the basis of cost-benefit to the life safety, property, environment, and economic vitality of the state.

Committee Organization:

Membership

1. Department of Natural Resources – Geology & Earth Resources – State Geologist
2. Office of Superintendent of Public Instruction
3. Association of Washington Cities
4. Washington State Association of Counties
5. Department of Transportation
6. Emergency Management Division
7. University of Washington - State Seismologist
8. Washington State Emergency Management Association
9. Office of Community Services – Growth Management

10. EMC Representative – Building Officials
11. Department of Health
12. Department of Ecology
13. Washington Association of Hospitals
14. Cascadia Region Earthquake Work Group
15. Association of Sheriffs and Police Chiefs
16. Office of the Insurance Commissioner
17. American Society of Civil Engineers
18. Structural Engineers of Washington
19. Washington State Patrol
20. Washington Public Ports Association
21. State/Local Tsunami Work Group
22. Federal Emergency Management Agency Region X
23. USGS
24. NOAA/PMEL
25. Infrastructure Assistance Coordinators Council (IACC)
26. Department of Information Services
27. Office of Financial Management Policy & Budget
28. Association of Washington Businesses
29. County Road Administration Board
30. Other entities as the EMC may designate from time to time

Committee Guidelines:

- The committee will function under the direction of the EMC and in accordance with its by-laws.
- The committee will meet monthly or as needed, to make decisions, provide guidance and propose statewide seismic policy.
- Membership and other appropriate sources will provide staffing and support for subcommittees formed to work specific functional areas. A more permanent staff support plan may be developed.
- Options to appropriate funding for the committee will be examined including the use of federal grants, state general funds, and/or a combination of funding from the participating agencies.
- Committee will advise EMC and carry out other functions as the EMC may direct.

Meeting Participants

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List of Abbreviations and Acronyms

DFO	Disaster Field Office
EMC	Emergency Management Council
EMD	Emergency Management Division (Washington State Military Department)
FEMA	Federal Emergency Management Agency
HAZUS	Hazard U.S.
HMGP	Hazard Mitigation Grant Program
NAWAS	National Warning System
NOAA	National Oceanographic and Atmospheric Administration
PMEL	Pacific Marine and Environmental Laboratory (a division of NOAA)
RACE	Rapid Alert of Cascadia Earthquakes
SSC	Seismic Safety Committee
USGS	United States Geological Survey
UW	University of Washington
WSDOT	Washington State Department of Transportation